

## **ROBOTICS: 1988-1993**

### **A select list of books, journals, reports, AV materials and databases available in the NIST Research Information Center (RIC)**

MCGRAW-HILL'S DICTIONARY OF SCIENTIFIC TERMS defines robot as a "mechanical device that can be programmed to perform a variety of tasks of manipulation and locomotion under automatic control."

The word "robot" was first established in a play called R.U.R. (Rossum's Universal Robots) by Karl Capek in 1920.<sup>1</sup> The term came from a Czech word "robota" meaning "forced labor." Around 1950, Isaac Asimov's science fiction work "I, robot" set the code for robot conduct; above all robots may not injure human beings. He also was the first to use the word "robotics" to describe robot technology.<sup>2</sup>

The beginning of true industrial robotics is considered to be a patent in 1954 by George C. Devol, "the robot man," for a manipulator with a memory that controlled its sequential movements. He patented "universal automation" or "unimation" for short.

The "Father of the Robot," Joseph Engelberger, founded a firm called Unimation, Inc. which was the world's largest robot producing company. ROBOTICS IN PRACTICE: MANAGEMENT AND APPLICATIONS OF INDUSTRIAL ROBOTS (TS59.4 .E53 1980) is a popular book that he has authored.

General Motors bought the first Unimate robot in 1961 and robots are still widely used in the automobile industry today.

If we put the development of robotics into decades, then the 1960's was the decade in which numerical control came into maturity. Robotics in the 1970's established the computer, in particular CNC (computer numerical control). The 1980's saw advances in the development of robot control, robot sensing and the quality of robot manufacturing<sup>2</sup> because of the availability of inexpensive PCs, single board computers, various buses and computerboards (ADC, DAC, DMA, etc.).

Today, the field of robotics is venturing into many areas such as assembly, construction, underwater exploration, the aerospace industry, the laboratory, transportation, and nuclear processing and remediation. As evidence of the topic of robotics revealing a high level of interest, the American Nuclear Society dedicated its Fifth Topical Meeting to the subject, ANS FIFTH TOPICAL MEETING ON ROBOTICS AND REMOTE SYSTEMS; 1993 25-30 April; Knoxville, Tenn. (TJ210.3 .A58 1993)

Here at NIST, the Manufacturing Engineering Laboratory is developing many of the essential elements of automated intelligent processing systems that will soon be at the core of all world-class manufacturing operations.<sup>3</sup> Some areas of interest include intelligent machine

controls, performance measures, robot metrology, mobile robotic systems, sensory intelligence, systems integration, robotic deburring of machined parts, and construction robotics.

An outstanding example of NIST's work in robotics is the Robocrane. Recently, the Robocrane was named by POPULAR SCIENCE as "one of the year's 100 greatest achievements in science and technology."<sup>4</sup> CONSTRUCTION EQUIPMENT magazine selected it as "one of the 100 most significant new products in 1992." The NIST Robocrane transfers robotics technology to construction cranes. It is a very large robot that can lift more than five times its own weight and can position loads weighing many tons to an accuracy of about a millimeter.

Two important works in the area of robotics include a series of conferences published by the IEEE entitled IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (TJ210.3 .I35) and Richard Paul's work: ROBOT MANIPULATORS: MATHEMATICS, PROGRAMMING AND CONTROL: THE COMPUTER CONTROL OF ROBOT MANIPULATORS (TS191.8 .P38). A good overview of the robotics industry and a dictionary of robotics terms is given in V. Daniel Hunt's ROBOTICS SOURCEBOOK (TJ211 .H85 1988 REF).

The following is a select list of books, journal titles, NIST reports and AV materials published in the last five years that are available in the Research Information Center. A list of databases is also included. Items for the bibliography were chosen only if robot or robotics was the main topic of the publication or video recording. The list is arranged by LC (Library of Congress) Classification System. For copies of this list, contact: Diane Cunningham /101/E127/ x3053/ dianec@nist.gov.

## **REFERENCES**

1. Sieburth, Janice F. The development of robotics and its literature: overview with bibliography. Science and Technology Libraries Winter 1983, p.1.
2. Hodges, Bernard. Industrial robotics. 2nd ed. Boston: BH Newnes, 1992, p.1,5.
3. Research. Services. Facilities. NIST SP 817; 1991 August, p.24.
4. NIST monthly highlights. 1993 April, p.4-5.

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### **BOOKS, JOURNALS, REPORTS, AV MATERIALS**

Q325.5 .A66 1991

Bourbakis, Nikolaos, G., ed. **Applications of learning & planning methods.** Teaneck, N.J.: World Scientific, c1991.

Q325.5 .I57 1989

Segre, Alberto Maria, ed. **Proceedings of the sixth international workshop on machine learning;** 1989 June 26-27; Cornell University, Ithaca, N.Y. San Mateo, Calif.: Morgan Kaufman, c1989.

Q325.5 .I57 1990

Porter, Bruce and Raymond Mooney, eds. **Proceedings of the seventh international workshop on machine learning;** 1990 June 21-23; University of Texas, Austin, Texas. San Mateo, Calif.: Morgan Kaufman, c1990.

Q334 .A672 1992

**Applications of artificial intelligence X: machine vision and robotics.** Bellingham, Wash.: SPIE, c1992. (Proceedings of SPIE;1708)

Q334.C66

**Proceedings of the conference on artificial intelligence applications.** Washington, D.C.: IEEE Computer Society Press, 1987-

Q334.G46 1989

Kapur, Deekpak and Joseph L. Mundy, eds. **Geometric reasoning.** Cambridge, Mass: MIT Press, c1988.

QA76.76 .E95N385 1990

Jordanides, Timothy and Bruce Torby, eds. **Proceedings of the NATO Advanced Study Institute on Expert Systems and Robotics.** New York: Springer-Verlag, c1991.

QB501 .S76 1993 AV

Stone, Edward C. **The solar system [videorecording] : a new view (robotic exploration).** Gaithersburg, Md: National Institute of Standards and Technology, 1993.

QC100 .U56 NO.88-3735 1988 NIST-PUB

Michaloski, John L. **Coordinated joint motion for an industrial robot.** Gaithersburg, Md: National Bureau of Standards, 1988.  
NBSIR 88-3735

QC100 .U56 NO.88-3772 1988 NIST-PUB

Moncarz, Howard T. **Implementation of the inspection robot controller.** Gaithersburg, Md.: National Bureau of Standards, 1988.

NBSIR 88-3772

QC100 .U56 NO.88-3804 1988 NIST-PUB

Murphy, Karl, et al. **Cleaning and deburring workstation operations manual.**

Gaithersburg, Md.: National Bureau of Standards, 1988.

NBSIR 88-3804

QC100 .U56 NO.89-4115 1989 NIST-PUB

Proctor, Frederick M. and Robert Russell. **Recommended technical specifications for procurement of systems for a cleaning and deburring workstation.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NISTIR 89-4115

QC100 .U56 NO.89-4215 1989 NIST-PUB

Fiala, John C. **Note on NASREM implementation.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NISTIR 89-4215

QC100 .U56 NO.89-4217 1989 NIST-PUB

Raviv, Daniel and Martin Herman. **Towards an understanding of camera fixation.**

Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NISTIR 89-4217

QC100 .U56 NO.89-4223 1989 NIST-PUB

Bostelman, Roger. **Electronics design of the infrared/ultrasonic sensing for a robot gripper.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NISTIR 89-4223

QC100 .U56 NO.90-4251 1990 NIST-PUB

Michaloski, John L., Thomas E. Wheatley, and Ronald Lumia. **Analysis of computational parallelism with a concurrent hierarchical robot control system.** Gaithersburg, Md:

National Institute of Standards and Technology, 1990.

NISTIR 90-4251

QC100 .U56 NO.90-4286 1990 NIST-PUB

Fiala, John C. and Al Wavering. **Implementation of a Jacobian-transpose algorithm.**

Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

NISTIR 90-4286

QC100 .U56 NO.4324 1990 NIST-PUB

Raviv, Daniel. **A quantitative approach to camera fixation.** Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

NISTIR 4324

QC100 .U56 NO.4386 1990 NIST-PUB

Michaloski, John and Thomas Wheatley. **System factors in real-time hierarchical control.**

Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

NISTIR 4386

QC100 .U56 NO.4463 1990 NIST-PUB

Lumia, Ronald. **Short-term evolution for the flight telerobotic servicer.** Gaithersburg,

Md.: National Institute of Standards and Technology, 1990.

NISTIR 4463

QC100 .U56 NO.4471 1991 NIST-PUB

Warsaw, Barry and John Michaloski. **The TROI (Telerobotic Operator Interface) user's guide.** Gaithersburg, Md.: National Institute of Standards and Technology, 1991.

NISTIR 4471

QC100 .U56 NO.4476 1991 NIST-PUB

Raviv, Daniel and Martin Herman. **A new approach to vision and control for road following.** Gaithersburg, Md.: National Institute of Standards and Technology, 1991.

NISTIR 4476

QC100 .U56 NO.4510 1991 NIST-PUB

Dagalakis, Nicholas. **Robot characterization testing.** Gaithersburg, Md.: National Institute of Standards and Technology, 1991.

NISTIR 4510

QC100 .U56 NO.4595 1991 NIST-PUB

Bostelman, Roger. **Description of a vibration compensation system for the small scale model robot crane project.** Gaithersburg, Md.: National Institute of Standards and

Technology, 1991.

NISTIR 4595

QC100 .U56 NO.4826 1992 NIST-PUB

Coombs, David and Christopher Brown. **Real-time smooth pursuit tracking for a moving binocular robot.** Gaithersburg, Md.: National Institute of Standards and Technology, 1992.

NISTIR 4826

QC100 .U56 NO.4928 1992 NIST-PUB

Stouffer, Keith A. **Development of the forward and inverse kinematic models for the advanced deburring and chamfering system (ADACS) industrial robot.** Gaithersburg,

Md.: National Institute of Standards and Technology, 1992.

NISTIR 4928

QC100 .U57 NO.784 1990 NIST-PUB

Quintero, Richard, ed. **DOE/NIST workshop on common architectures for robotic systems: proceedings.** Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

NIST SP 784

QC100 .U5753 NO.1254 1988 NIST-PUB

Fiala, John C. **Interfaces to teleoperation devices.** Gaithersburg, Md.: National Institute of Standards and Technology, 1988.

NIST TN 1254

QC100 .U5753 NO.1255 1988 NIST-PUB

Fiala, John C. **Manipulator servo level task decomposition.** Gaithersburg, Md.: National Institute of Standards and Technology, 1988.

NIST TN 1255

QC100 .U5753 NO.1256 1988 NIST-PUB

Wavering, Albert J. **Manipulator primitive level task decomposition.** Gaithersburg, Md.: National Institute of Standards and Technology, 1988.

NIST TN 1256

QC100 .U5753 NO.1258 1989 NIST-PUB

Kelmar, Linda. **Manipulator servo level world modeling.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NIST TN 1258

QC100 .U5753 NO.1267 1989 NIST-PUB

Dagalakis, Nicholas G., et al. **Robot crane technology: final report.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NIST TN 1267

QC100 .U5753 NO.1273 NIST-PUB

Kelmar, Laura. **Manipulator primitive level world modeling.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

NIST TN 1273

QC100 .U5753 NO.1277 NIST-PUB

Albus, James, et al. **Concept for a reference model architecture for real-time intelligent control systems: ARTICS.** Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

NIST TN 1277

QD75.4 .A8A3

**Advances in laboratory automation robotics.** Hopkinton, Mass.: Zymark Corp., 1984-

QD75.4 .A8K56 1989

Kingston, Howard M. and M. L. Kingston. **Recommendations for nomenclature in laboratory robotics.** Gaithersburg, Md.: National Institute of Standards and Technology, 1989.

QP310 .H36V57 1990

Goodale, Melvyn A., ed. **Vision and action: the control of grasping.** Norwood, N.J.: Ablex Pub. Corp., c1990.

T21 .U57 1991

United States. Congress. House. Committee on Science, Space, and Technology. Subcommittee on Technology and Competitiveness. **Critical technologies: machine tools, robotics, and manufacturing:** hearing before the Subcommittee on Technology and Competitiveness of the Committee on Science, Space, and Technology, U.S. House of Representatives, One Hundred Second Congress, first session, May 9, 1991. Washington: G.P.O., 1991.

T59.7 .H86 1992

Rahimi, Mansour and Waldemar Karwowski, eds. **Human-robot interaction.** Washington, D.C.: Taylor & Francis, 1992.

T385 .C87 1992

Silbermann, Martine J. and Hemant D. Tagare, eds. **Curves and surfaces in computer vision and graphics II;** 1991 November 12-14; Boston, Mass. Bellingham, Wash.: SPIE, c1992. (Proceedings of SPIE;1610)

TA345 .C68 1990

Krishnan, V., et al. **Constraint reasoning and planning in concurrent design.** Pittsburgh, Pa.: Carnegie Mellon University, 1990.

TA345 .I5486 1988

Tipnis, V.A. and E.M. Patton, eds. **Proceedings of the ASME international computers in engineering conference and exhibition;** 1988 July 31-August 4; San Francisco, Calif. New York: American Society of Mechanical Engineers, c1988.

TA345 .I5486 1991

Gupta, Gopal and Terry E. Shoup, eds. **Proceedings of the international computers in engineering conference and exposition.;** 1991 August 18-22; Santa Clara, Calif. New York: American Society of Mechanical Engineers, c1991.

TA345 .I5486 1992

Gabriele, Gary A., ed. **Proceedings of the international computers in engineering conference and exposition;** 1992 August 2-6; San Francisco, Calif. New York: American Society of Mechanical Engineers, c1992.

TA1632 .C58 1990

Clark, James J. and Alan L. Yuille. **Data fusion for sensory information processing systems.** Boston: Kluwer Academic Publishers, c1990.

TA1632 .M33 1992

Batchelor, Bruce G., Michael J.W. Chen, and Frederick M. Waltz, eds. **Machine vision architectures, integration, and applications**; 1991 November 12-15; Boston, Mass. Bellingham, Wash.: SPIE, c1992. (Proceedings of SPIE;1615)

TA1632 .M63 1992

Larson, Rodney M. and Hatem N. Nasr, eds. **Model-based vision development and tools**; 1991 November 14-15; Boston, Mass. Bellingham, Wash.: SPIE, c1992. (Proceedings of SPIE;1609)

TA1632 .N38 1990

Nayar, Shree K., Katsushi Ikeuchi, and Takeo Kanade. **Shape from interreflections**. Pittsburgh, Pa.: Carnegie Mellon University, The Robotics Institute, 1990.

TA1632 .S47 1989

Schenker, Paul S., ed. **Sensor fusion: spatial reasoning and scene interpretation**; 1988 November 7-9; Cambridge, Mass. Bellingham, Wash.: SPIE, c1989. (Proceedings of SPIE;1003)

TA1632 .S94 1989

Szeliski, Richard. **Bayesian modeling of uncertainty in low-level vision**. Boston: Kluwer Academic Publishers, c1989.

TA1632 .T66 1990

Tomita, Fumiaki and Saburo Tsuji. **Computer analysis of visual textures**. Boston: Kluwer Academic Publishers, c1990.

TA1650 .S46 1991

Schenker, Paul S., ed. **Sensor fusion III: 3-D perception and recognition**; 1990 November 5-8; Boston, Mass. Bellingham, Wash.: SPIE, c1991. (Proceedings of SPIE;1383)

TJ210.2 .I18

**IEEE transactions on robotics and automation**. New York: IEEE, c1989-

TJ210.2 .I6

**International journal of robotics & automation**. Anaheim, Calif.: ACTA Press, 1986-

TJ210.2 .R625

**The robotics review**. Cambridge, Mass.: MIT Press, c1989-

TJ210.3 .A47 1989

Youcef-Toumi, Y. and H. Kazerooni., eds. **Proceedings of the American Society of Mechanical Engineers winter meeting. robotics research - 1989**: December 10-15, San Francisco, Calif. New York: ASME, c1989.

TJ210.3 .E87 1991

Varela, Francisco J. and Paul Bourgine, eds. **Proceedings of the first European conference on artificial life: toward a practice of autonomous systems**; 1991; Paris, France. Cambridge, Mass.: MIT Press, c1992.

TJ210.3 .E96 1990

Hayward, V. and O. Khatib, eds. **Proceedings of the first international symposium on experimental robotics**; 1989 June 19-21; Montreal. New York: Springer-Verlag, c1990.

TJ210.3 .G46 1989

Boissonnat, J.D. and J.P. Laumond, eds. **Proceedings of the workshop on geometry and robotics**; 1988 May 26-28; Toulouse, France. New York: Springer-Verlag, 1989.

TJ210.3 .I45 1986

Kopacek, P., I. Troch, and K. Desoyer, eds. **Proceedings of the IFAC/IFIP/IMACS symposium on theory of robots; selected papers**; 1986 December 3-5; Vienna, Austria. New York: Pergamon Press, 1988.

TJ210.3 .I575

**Intelligent robots and computer vision.** Bellingham, Wash.: SPIE, 1992. (Proceedings of SPIE)

TJ210.3 .I5765 1989

Waldron, K., ed. **Proceedings of the fourth international conference on advanced robotics**; 1989 June 13-15; Columbus, Ohio. New York: Springer-Verlag, c1989.

TJ210.3 .I5787 1991

Vidyasagar, M. and Mohan Trivedi, eds. **Proceedings of the first international symposium on intelligent robotics**; 1991 January 2-5; Bangalore, India. New York: McGraw-Hill Pub. Co., c1991. (Proceedings of SPIE;1571)

TJ210.3 .N36 1988

Tou, Julius T. and Jens G. Balchen, eds. **Proceedings of the NATO Advanced Research Workshop on Highly Redundant Sensing in Robotic Systems**; 1988; Il Ciocco, Italy. New York: Springer-Verlag, c1990.

TJ210.3 .N376 1986

Dario, Paolo, ed. **Proceedings of the NATO Advanced Workshop on Sensors and Sensory Systems for Advanced Robots**; 1986; Maratea, Italy. New York: Springer-Verlag, c1988.

TJ210.3 .N377 1989

Henderson, Thomas C., ed. **Proceedings of the NATO Advanced Research Workshop on Traditional and Non-traditional Robotic Sensors**; 1989; Maratea, Italy. New York: Springer-Verlag, c1990.

TJ210.4 .C66 1990 REF

Dorf, Richard C. and Shimon Y. Nof, eds. **Concise international encyclopedia of robotics: applications and automation.** New York: Wiley, c1990.

TJ210.5 .R57 1991 REF

**RI/SME robotics research & development laboratory directory.** Dearborn, Mich.: Robotics International of SME, 1991-

TJ211 .A384 1991

Sifter, S. and J. Lenarcic, eds. **Advances in robot kinematics: with emphasis on symbolic computation.** New York: Springer-Verlag, c1991.

TJ211 .A53 1988

Andersson, Russell L. **A robot ping-pong player: experiment in real-time intelligent control.** Cambridge, Mass.: MIT Press, c1988.

TJ211 .B335 1991

Balafoutis, C.A. and R.V. Patel. **Dynamic analysis of robot manipulators: a Cartesian tensor approach.** Boston: Kluwer Academic Publishers, c1991.

TJ211 .C66 1988

Craig, John J. **Adaptive control of mechanical manipulators.** Reading, Mass.: Addison-Wesley, c1988.

TJ211 .D38 1992

Abidi, Mongi A. and Rafael C. Gonzalez, eds. **Data fusion in robotics and machine intelligence.** Boston: Academic Press, c1992.

TJ211 .D49 1990

Venkataraman, S.T. and T. Iberall, eds. **Dextrous robot hands.** New York: Springer-Verlag, c1990.

TJ211 .D53 1991

Dhillon, B.S. **Robot reliability and safety.** New York: Springer-Verlag, c1991.

TJ211 .D87 1988

Durrant-Whyte, Hugh F. **Integration, coordination, and control of multi-sensor robot systems.** Boston: Kluwer Academic Publishers, c1988.

TJ211 .F72 1991

Fraser, Anthony R. and Ron W. Daniel. **Perturbation techniques for flexible manipulators.** Boston: Kluwer Academic Publishers, c1991.

TJ211 .H85 1988 REF

Hunt, V. Daniel. **Robotics sourcebook.** New York: Elsevier, 1988.

TJ211 .H863 1990

Hunt, V. Daniel. **Understanding robotics.** San Diego: Academic Press, c1990.

TJ211 .I476 1991

Tzafestas, Spyros G., ed. **Intelligent robotic systems.** New York: M. Dekker, 1991.

TJ211 .L32

**Laboratory robotics and automation.** New York: VCH Publishers, 1989-

TJ211 .L44 1989

Lee, Mark H. **Intelligent robotics.** New York: Halsted Press, 1989.

TJ211 .M535 1988

Miller, Rex. **Fundamentals of industrial robots and robotics.** Boston, Mass.: PWS-KENT Publishing Co., c1988.

TJ211 .M845 1990

Mehrotra, Rajiv and Murali R. Varanasi, eds. **Multirobot systems.** Los Alamitos, Calif.: IEEE Computer Society Press, c1990.

TJ211 .N34 1991

Nakamura, Yoshihiko. **Advanced robotics: redundancy and optimization.** Reading, Mass.: Addison-Wesley, c1991.

TJ211 .N38 1991

**National security assessment of the U.S. robotics industry.** Washington ?: U.S. Dept. of Commerce, Bureau of Export Administration, Office of Industrial Resource Administration, Strategic Analysis Division, 1991.

TJ211 .R49 1988

Rivin, Eugene I. **Mechanical design of robots.** New York: McGraw-Hill, c1988.

TJ211 .R53 1988

Andeen, Gerry B., ed. **Robot design handbook.** New York: McGraw-Hill, c1988.

TJ211 .R558

**Robotics and autonomous systems.** Amsterdam: Elsevier, 1988-

TJ211 .R566 1990

Moray, N., W.R. Ferrell, and W.B. Rouse, eds. **Robotics, control, and society: essays in honor of Thomas B. Sheridan.** New York: Taylor & Francis, c1990.

TJ211 .R568 1988

Bolles, Robert C. and Bernard Roth, eds. **Proceedings of the fourth international symposium on robotics research.** Cambridge, Mass.: MIT Press, c1988.

TJ211 .R568 1990

Miura, Hirofumi and Suguru Arimoto, eds. **Proceedings of the fifth international symposium on robotics research.** Cambridge, Mass.: MIT Press, c1990.

TJ211 .R5683 1989

Brady, Michael, ed. **Robotics science.** Cambridge, Mass.: MIT Press, c1989.

TJ211 .R5685 1989

**Robotics technology and its varied uses:** hearing before the Subcommittee on Science, Research, and Technology of the Committee on Science, Space, and Technology, U.S. House of Representatives, One Hundred First Congress, first session, September 25, 1989. Washington: G.P.O., 1989.

TJ211 .R62 1990 AV

**Robot crane and robot metrology [videorecording].** Gaithersburg, Md.: National Institute of Standards and Technology, 1990.

TJ211 .S226 1991

Graham, James H., ed. **Safety, reliability, and human factors in robotic systems.** New York: Van Nostrand Reinhold, c1991.

TJ211 .S43 1988

Segre, Alberto Maria. **Machine learning of robot assembly plans.** Boston: Kluwer Academic Publishers, c1988.

TJ211 .S55 1988

Skibniewski, Miroslaw J. **Robotics in civil engineering.** New York: Van Nostrand Reinhold, c1988.

TJ211 .T443 1992

Becquet, Marc C., ed. **Teleoperation: numerical simulation and experimental validation.** Boston: Kluwer Academic Publishers, c1992.

TJ211 .V35 1992

Valavanis, K. and George N. Saridis. **Intelligent robotic systems: theory, design, and applications.** Boston: Kluwer Academic Publishers, c1992.

TJ211 .V83513 1989

Vukobratovic, Miomir. **Applied dynamics of manipulation robots: modelling, analysis and examples.** New York: Springer-Verlag, c1989.

TJ211 .V838213 1989

Vukobratovic, Miomir. **Introduction to robotics.** New York: Springer-Verlag, 1989.

TJ211 .Y6713 1990

Yoshikawa, Tsuneo. **Foundations of robotics: analysis and control.** Cambridge, Mass.: MIT Press, c1990.

TJ211.3 .A14 1991

Mayhew, John E.W. and John P. Frisby, eds. **3D model recognition from stereoscopic cues.** Cambridge, Mass.: MIT Press, 1991.

TJ211.3 .A9513 1991

Ayache, Nicholas. **Artificial vision for mobile robots: stereo vision and multisensory perception.** Cambridge, Mass.: MIT Press, c1991.

TJ211.3 .C34 1990

Caillas, Claude. **Thermal imaging for robotic applications in outdoor scenes.** Pittsburgh, Pa.: Carnegie Mellon University, 1990.

TJ211.3 .F35 1988

Fairhurst, Michael. **Computer vision for robotic systems: an introduction.** New York: Prentice-Hall, 1988.

TJ211.3 .K78 1990

Krumm, John and Steven A. Shafer. **Local spatial frequency analysis for computer vision.** Pittsburgh, Pa.: Carnegie Mellon University, 1990.

TJ211.35 .B64 1992

Boer, Friso George de. **Multivariable servo control of a hydraulic rrr-robot.** S.l.: s.n., 1992.

TJ211.35 .B67 1991

Bos, Jan Frans Tonnis. **Man-machine aspects of remotely controlled space manipulators.** S.l.: s.n., 1991.

TJ211.35 .D38 1991

Davidor, Yuval. **Genetic algorithms and robotics: a heuristic strategy for optimization.** Teaneck, N.J.: World Scientific, c1991.

TJ211.35 .D42 1989

De Silva, Clarence W. and A.G.J. MacFarlane. **Knowledge-based control with application to robots.** New York: Springer-Verlag, c1989.

TJ211.35 .I58 1990

de Wit, C. Canudas, ed. **Proceedings of the international workshop on nonlinear and adaptive control: issues in robotics; 1990 November 21-23; Grenoble, France.** New York: Springer-Verlag, c1991.

TJ211.35 .M53 1991

Tzafestas, Spyros G., ed. **Microprocessors in robotic and manufacturing systems.** Boston: Kluwer Academic Publishers, c1991.

TJ211.35 .N37 1988

Lee, C.S. George, ed. **Proceedings of the NATO Advanced Research Workshop on Sensor-based Robots: Algorithms and Architectures;** 1988; Chateau de Bonas, France. New York: Springer-Verlag, 1991.

TJ211.35 .S56 1989

Skowronski, Jan M. **Control theory of robotic systems.** Teaneck, N.J.: World Scientific, c1989.

TJ211.35 .S96 1991

Troch, I., K. Desoyer, and P. Kopacek, eds. **Proceedings of the third IFAC/IFIP/IMACS symposium on robot control (SYROCO '91); selected papers;** 1991 September 16-18; Vienna, Austria. New York: Pergamon Press, 1992.

TJ211.35 .W55 1991

Willigenburg, Lois Gerard, van. **Digital optimal control of rigid manipulators.** S.l.: s.n., 1991.

TJ211.4 .B57 1990

Vukobratovic, M., et al. **Biped locomotion: dynamics, stability, control and application.** New York: Springer-Verlag, c1990.

TJ211.4 .B87 1992

Burger, Wilhelm and Bir Bhanu. **Qualitative motion understanding.** Boston: Kluwer Academic Publishers, c1992.

TJ211.4 .C36 1988

Canny, John. **The complexity of robot motion planning.** Cambridge, Mass.: MIT Press, c1988.

TJ211.4 .H6 1990

Ho, C.Y. and Jen Sriwattanathamma. **Robot kinematics: symbolic automation and numerical synthesis.** Norwood, N.J.: Ablex Publishing Corp., c1990.

TJ211.4 .L38 1991

Latombe, Jean-Claude. **Robot motion planning.** Boston: Kluwer Academic Publishers, c1991.

TJ211.4 .L55 1992

Lilly, Kathryn W. **Efficient dynamic simulation of robotic mechanisms.** Boston: Kluwer Academic Publishers, c1993.

TJ211.4 .W67 1989

**Proceedings of the workshop on visual motion;** 1989 March 20-22; Irvine, Calif. Los Alamitos, Calif.: IEEE Computer Society Press, c1989.

TJ211.415 .A87 1991

Iyengar, S.S. and Alberto Elfes, eds. **Autonomous mobile robots.** Los Alamitos, Calif.: IEEE Computer Society Press, c1991.

TJ211.415 .A88 1990

Cox, Ingemar J. and Gordon T. Wilfong, eds. **Autonomous robot vehicles.** New York: Springer-Verlag, c1990.

TJ211.415 .C66 1990

Connell, Jonathan H. **Minimalist mobile robotics: a colony-style architecture for an artificial creature.** Boston: Academic Press, c1990.

TJ211.415 .I54 1991

Schmidt, G., ed. **Proceedings of the international workshop on information processing in autonomous mobile robots;** 1991 March 6-8; Munchen, Germany. New York: Springer-Verlag, 1991.

TJ211.415 .M38 1991

Meystel, A. **Autonomous mobile robots: vehicles with cognitive control.** Teaneck, N.J.: World Scientific, c1991.

TJ211.415 .M63

**Mobile robots.** Bellingham, Wash.: SPIE, c1987- (Proceedings of SPIE)

TJ211.417 .D66 1989

Donald, Bruce R. **Error detection and recovery in robotics.** New York: Springer-Verlag, c1989.

TJ211.42 .R67 1989

Rosheim, Mark E. **Robot wrist actuators.** New York: Wiley, c1989.

TJ211.44 .M43 1990

Mel, Bartlett W. **Connectionist robot motion planning: a neurally-inspired approach to visually-guided reaching.** Boston: Academic Press, c1990.

TJ211.45 .H36 1992

Lozano-Perez, Tomas, et al. **Handey: a robot task planner.** Cambridge, Mass.: MIT Press, c1992.

TJ211.45 .N37 1988

Ravani, Bahram, ed. **Proceedings of the NATO Advanced Workshop on CAD Based Programming for Sensory Robots;** 1988; Il Ciocco, Italy. New York: Springer-Verlag, c1988.

TJ213 .B67 1990

Bourne, David Alan and Duane T. Williams. **Using the feature exchange language in the next generation controller.** Pittsburgh, Pa.: Carnegie Mellon University, The Robotics Institute, 1990.

TJ213 .S45522 1992

Sheridan, Thomas B. **Telerobotics, automation, and human supervisory control.** Cambridge, Mass.: MIT Press, c1992.

TJ223 .M53D53 1989

Fargeon, C., ed. **The digital control of systems: applications to vehicles and robots.** New York: Van Nostrand Reinhold, c1989.

TJ223 .M53N48 1990

Miller, W. Thomas, Richard S. Sutton, and Paul J. Werbos, eds. **Neural networks for control.** Cambridge, Mass.: MIT Press, c1990.

TK153 .M468 1990

**Micro electro mechanical systems: an investigation of micro structures, sensors, actuators, machines and robots;** 1990 February 11-14; Napa Valley, Calif. New York: Institute of Electrical and Electronics Engineers, 1990.

TL210.3 .N37 1987

Taylor, Gaynor E., ed. **Proceedings of the NATO Advanced Research Workshop on Kinematic and Dynamic Issues in Sensor Based Control;** 1987; Il Ciocco, Italy. New York: Springer-Verlag, c1990.

TL797 .C628 1992

Stoney, William E., ed. **Cooperative intelligent robotics in space II;** 1991 November 12-14; Boston, Mass. Bellingham, Wash.: SPIE, c1992. (Proceedings of SPIE;1612)

TL671.28 .R635 1989

**Robots in aerospace manufacturing;** 1989 February 20-23; Irvine, Calif. Dearborn, Mich.: Society of Manufacturing Engineers; Ann Arbor, Mich.: Robotic Industries Association, 1989.

TL797 .C66 1991

deFigueroedo, Rui J. and William E. Stoney, eds. **Cooperative intelligent robotics in space;** 1990 November 6-7; Boston, Mass. Bellingham, Wash.: SPIE, c1991. (Proceedings of SPIE;1387)

TL875 .I58 1992

Desrochers, Alan A., ed. **Intelligent robotic systems for space exploration.** Boston: Kluwer Academic Publishers, c1992.

TS155.6 .I443 1989

Halevi, G., ed. **Proceedings of the IFIP TC5/WG5.3 international conference on CAD/CAM and AMT; robotic systems and AMT**; 1989 December 11-14; Jerusalem, Israel. New York: North-Holland, 1990.

TS155.6 .I5818 1990

Dwivedi, Suren N., Alok K. Verma, and John E. Sneedenberger, eds. **Proceedings of the fifth international conference on CAD/CAM, robotics, and factories of the future '90**; 1990; Norfolk, Va. New York: Springer-Verlag, v.1, c1991; v.2, c1992.

TS155.6 .J36 1992

Leu, Ming, ed. **Proceedings of the fourth Japan-U.S.A. symposium on flexible automation**; 1992 July 13-15; San Francisco, Calif. New York: American Society of Mechanical Engineers, c1992.

TS155.6 .M6213 1990

Makarov, I.M., ed. **Modeling of robotic and flexible manufacturing systems**. New York: Hemisphere Pub., c1990.

TS178.4 .F584 1989

Tavora, Carlos J., ed. **Flexible assembly systems: insights based on experience (a round table discussion)**. Dearborn, Mich.: Society of Manufacturing Engineers, c1990.

TS191.8 .H64 1992

Hodges, Bernard. **Industrial robotics**. 2nd ed. Boston: BH Newnes, 1992.

TS191.8 .H68 1990

Hoshizaki, Jon and Emily Bopp. **Robot applications design manual**. New York: Wiley, c1990.

TS191.8 .I57 1989

**Proceedings of the twentieth international symposium on industrial robots**; 1989 October 4-6; Tokyo, Japan. Tokyo: Japan Industrial Robot Association, c1989.

TS191.8 .I58 1988

Jamshidi, M., et al., eds. **Proceedings of the second international symposium on robotics and manufacturing--research, education, and applications**; 1988 November 16-18; Albuquerque, N.M. New York: ASME Press, 1988.

TS191.8 .I58 1990

Jamshidi, M. and Mehrdad Saif, eds. **Proceedings of the third international symposium on robotics and manufacturing--research, education, and applications (ISRAM '90)**; 1990 July 18-20; Burnaby, B.C. New York: ASME Press, 1990.

TS191.8 .M32 1988

Mair, Gordon M. **Industrial robotics.** New York: Prentice-Hall, 1988.

TS191.8 .M361

**Manufacturing automation.** Mill Valley, Calif.: Vital Information Publications, c1991-

TS191.8 .R55 REF ABS

**Robomatix reporter.** New York: EIC/Intelligence, 1983-1988.

TS191.8 .R55 REF ABS

**Robotics abstracts.** New York: Bowker A & I Pub., 1989-

TS191.8 .R57

**Robot.** Tokyo: Japan Industrial Robot Association, 1971-

TS191.8 .R63 REF BUSNS

**Robotics product database.** Orlando, Fla.: Flora Communications, c1988-

TS191.8 .R65

**Robotics today.** Dearborn, Mich.: SME, 1979-1987.

TS191.8 .R874 1990

Russell, Andrew R. **Robot tactile sensing.** New York: Prentice-Hall, c1990.

## DATABASES

**AEROSPACE DATABASE.** New York: American Institute of Aeronautics and Astronautics (AIAA), 1962-

**COMPENDEX\*PLUS.** Hoboken, N.J.: Engineering Information, 1970-

**INSPEC.** United Kingdom: Institution of Electrical Engineers (IEE), 1969-

**NTIS.** Springfield, Va.: National Technical Information Service (NTIS), 1964-

**SUPERTECH.** New York: Bowker Electronic Publishing, 1973-